CASE STUDY

PROVIDING SECURE COMMUNICATION FOR THE SWISS MOUNTAINS' MAJOR RAILWAY

RADIO ACTIVITY KEEPS CONTROL ROOMS' PERSONNEL IN CONTACT WITH THE TRAIN DRIVER

The Montebello curve near the Morteratsch station at the Bernina Pass; against the famous backdrop with Morteratsch glacier, Piz Palue and Piz Bernina.
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BACKGROUND

CLIENT/COMPANY
Rhätische Bahn
(Bernina Express/RhB)

In the Swiss Alps, a major railway is connecting little mountain villages, the Grison canton capital Chur, world renowned Davos-Klosters and St. Moritz, the "top of the world". Trains start at 429 mt. above sea level and reach a wild mountain pass at 2,253 mt. A small section of the 380-km network is in Italy. 1,300 people are employed there, both in warm summers and in cold winters, where temperatures reach -30 C. They service VIPs traveling to Davos for the World Economic Forum, as well as ski fans attending the World Championship in St. Moritz. The canton borders Austria, Italy and Liechtenstein and local people speak 3 of the 4 languages currently spoken in Switzerland. About 20% of the network includes bridges, galleries or tunnels. Ever since July 2008, the "Rhaetian Railway in the Albula/Bernina Landscape" has been included in the list of UNESCO World Heritage sites.

MARKET SEGMENT
Railways

The locomotive driver needs constant and reliable connection to the Rail Control Center for communication. The tracks were first built in 1898, but keep undergoing optimization on a regular basis. The railway services both canton's commuters and tourists. In fact, for Graubünden canton residents, it represents a valuable alternative to driving.

TECHNOLOGY PROVIDER
Radio Activity srl
Milan - Italy

Communication between the train driver and the controller is paramount to ensure safety. They communicate in case of natural emergencies (like a fallen tree or rocks on the tracks). All communications are recorded and this is the primary means of communication, followed by the public mobile network system.

"With Radio Activity's base stations the company has a flexible modern system that is easy to manage and that dramatically reduces the need for maintenance."

- Reto Sidler, *Head of Electrical Assets*

PRODUCTS

- ✓ Radio Activity Simulcast dual mode network (41 base stations) connected by Ethernet on fiber cable;
- ✓ 54 local networks for local Rangers' communication. The newer are made with KAIROS;
- ✓ 180 trains with mobile radios;
- ✓ 500 walkie-talkies.

Glacier Express crossing the Landwasser viaduct near Filisur, Canton Graubuenden. © RhB: Photo courtesy of Christof Sonderegger.

The Davos-Filisur section of the line includes the spectacular Baerentritt Pass. © RhB: Photo courtesy of Tibert Keller.

CHALLENGES

RhB recently reorganized the Rail Control Center to optimize traffic at workplaces. The continuous change from one area to the other and from one line to the other presented some communications problems and involved a lot of manual work.

In the past, train personnel and the control center could only communicate via telephone with Interactive Voice Response (IVR) leading.

SOLUTION

By simply introducing an Ethernet connection, a whole new world opened:

- No leveling is needed: by just plugging in the equipment, the modulation is regulated via software.
- When the radio channel coverage changes, the relevant frequency is changed via software.
- Just one server is necessary to record all communications in all channels.
- In the past, a separated alarming component was needed. Today, with a simple software controller, the alarm gets recorded and sent by e-mail or pager.
- The adjustment tool can easily be regulated from the Control Center, without the need to run to the farther station to do so.

The frequency controlled by GPS provided a better voice quality in difficult overlapping areas of the valley covered with trees. The existing 33 base stations were increased to 40, resulting in a better coverage, compared with the previous one. This will enable RhB to have 2 channels available in the same frequency and in the same area. This resolved the frequencies run-out RhB was suffering.

RESULTS AND BENEFITS

This was a big project with many interfaces. The Radio Activity product line was the base and the rest was customized to connect it.

The client is now enjoying great flexibility, despite the complexity of the communication system. In fact, since the system's rollout in 2016, no base station presented any problems. The same components will be installed, in the near future, to cover the additional longer tunnels (Vereina 19 km and Albula 6 km, respectively) for RhB.

The Rhaetian Railway, near Bonaduz. © RhB: Photo courtesy of Tibert Keller.